

Rediscovery and neotypification of *Marsdenia arachnoidea* Schltr. (Apocynaceae: *Asclepiadoideae* - *Marsdenieae*), an endangered species from Papua New Guinea

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Summary

Forster, P.I. & Takeuchi, W. (2005). Rediscovery and neotypification of *Marsdenia arachnoidea* Schltr. (Apocynaceae: *Asclepiadoideae* - *Marsdenieae*), an endangered species from Papua New Guinea. *Austrobaileya* 7(1): 145–150. The rediscovery of the long-lost *Marsdenia arachnoidea* Schltr. is reported. A neotype is selected for the name *M. arachnoidea* and the species is described and illustrated. It is endemic to Morobe Province of north-eastern Papua New Guinea, where the only known populations are under threat from habitat alteration.

Key Words: Asclepiadaceae, Apocynaceae, *Marsdenia arachnoidea*, taxonomy, rediscovery, conservation, New Guinea flora

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Introduction

The genus *Marsdenia* R.Br. was recently revised by Forster (1995) for Australia and Papuasia (i.e. New Guinea, the Bismarck Archipelago, and the Solomon Islands). Including the single species described two years later (Forster 1997) there are currently 79 species recognized for the region.

Several species from New Guinea were not fully treated in Forster (1995) due to the destruction of type specimens at the Berlin-Dahlem Herbarium (B) in World War II, and the absence of conspecific collections referable to the lost types. Among these incompletely treated species was the distinctive *M. arachnoidea* Schltr. from north-eastern Papua New Guinea (PNG).

Marsdenia arachnoidea is distinguished by its long, filiform calyces, and by the unusual corona lobes with a retuse apex and basally involuted margins. Although the original collections were lost long ago, *M. arachnoidea* was fortuitously among the few species illustrated by Schlechter (1913). In the absence of authentically named specimens, Schlechter's illustration was previously the most effective

means for identifying the species. With the recent rediscovery of this plant, a more comprehensive description of *M. arachnoidea* can now be presented. In the following account the new gatherings are illustrated and the conservation status of extant populations is also summarized.

Taxonomy

Marsdenia arachnoidea Schltr., *Bot. Jahrb. Syst.* 50: 151 (1913).

Type Citation: "Nordöstl. Neu-Guinea: kleinere liane in den wäldern oberhalb Dschischungari, im Wariagebiet, ca. 1000 m ü M. (Schlechter n. 19845. – blühend im Juni 1909)"

Type: Papua New Guinea. MOROBE PROVINCE: Lae, hills near Taraka, 6° 37'S, 146° 55'E, 25 October 2003, *W. Takeuchi & D. Ama* 16667 (neo [here designated]: BRI; isoneo: A, LAE).

Illustration: Schlechter (1913: 151, fig. 10).

Wiry vine, prostrate or scandent, herbaceous, latex clear. Roots not seen. Indumentum of pale yellow-brown trichomes on most parts. Stems twining, cylindrical, up to 2 mm diameter, laxly provided with trichomes when young, usually

corky with age; internodes up to 14 cm long. Leaves petiolate; lamina lanceolate or oblong-lanceolate, up to 16 cm long and 5 cm wide, chartaceous, discolorous, upper surface dark green, glabrous except for scattered trichomes on midribs, lower surface pale green, trichomes short and sparse, denser on veins; colleters 8–10 at lamina base, conical, pale brown; venation brochidodromous, areolate in 1(–2) series near the margin, laterals 9–10 pairs, closing by supramedial loops, bifacially prominent, interlateral nervation reticulate, obscure above, raised below; petiole 20–40 mm long, *c.* 0.8 mm diameter, adaxially grooved, purple, trichomes dense. Cymes racemiform, up to 10 mm long; peduncles up to 8 mm long and *c.* 2 mm diameter, trichomes scattered; bracts filiform-lanceolate, up to 5 mm long, purple, with dense trichomes to 0.7 mm long. Flowers 13–15 mm long, 50–55 mm diameter; pedicels *c.* 7 mm long and 1 mm diameter, reddish-purple, with sparse, erect trichomes to 0.5 mm long. Sepals filiform-lanceolate, 18–19 mm long, *c.* 3.5 mm wide at base and *c.* 0.5 mm wide at tip, reddish-purple, with dense, erect trichomes to 0.5 mm long; colleters two at each sinus base. Corolla subrotate, reddish-purple and partly off-white in the tube, glossy; tube flattened, *c.* 7 mm long and 13 mm diameter, glabrous, with a raised mound under each corona lobe, not pouched at top; lobes filiform-lanceolate, fleshy, 24–25 mm long, *c.* 9 mm wide at base and 0.5 mm wide at tip, ciliate, otherwise glabrous; corolline corona absent. Staminal corona *c.* 7 mm long, 13–14 mm diameter, cream, lobes not in close proximity to one another, not overtopping style-head; each lobe *c.* 7 mm long, somewhat involuted or pouched at sides near the base, basal portion roughly rectangular, *c.* 3 mm wide at base, upper portion spatulate with a slightly retuse apex, *c.* 1 mm wide at tip. Staminal column 5–5.5 mm long, *c.* 4.5 mm diameter; anther appendages pandurate, *c.* 1 mm long and 1.5 mm wide; alar fissure *c.* 3 mm long. Style-head depressed-globose, *c.* 3 mm long and wide, apiculate tip *c.* 1 mm long and 0.2 mm wide. Ovaries not dissected. Pollinaria *c.* 0.8 mm long, 1.6–1.7 mm wide; pollinia ellipsoid, *c.* 0.8 mm long and 0.5 mm wide, yellow; corpusculum ovate, *c.* 0.7 mm long and 0.4 mm wide, tan-brown; caudicles *c.* 0.3 mm long and 0.1 mm wide. Follicles and seeds not seen. **Fig. 1.**

Additional specimen examined: Papua New Guinea. MOROBE PROVINCE: Lae, hills near Taraka, 6° 39'S, 146° 56'E, Aug 2004, *Takeuchi, Ama & Morris 17029* (A, BRI, CANB, LAE).

Distribution and habitat: Many of the circumstances surrounding the original discovery of *M. arachnoidea* are still unknown. Although the principal details from Schlechter's expeditions have been compiled in summary form (itineraries, place names, and trip routes; see appendices in Schlechter 1911–14), the type locality 'above Dschischungari' is nowadays impossible to place precisely as there is no longer any record of such a village (e.g., Department of District Administration 1968; Anonymous 1970). By reconstructing Schlechter's itinerary, it is otherwise clear that the species was first discovered somewhere in the south-easternmost part of the Bowutu Range (Dischore Range *vide* Schlechter), in proximity to what is today known as Mt Hahl (**Map 1**). A recent trip to this general vicinity (by one of the authors) was aborted by land ownership disputes. Investigation of the lower drainage by orchidologists has previously resulted in the rediscovery of several Schlechter species (Clements & Ziesing 1990). Although the Bowutu Range is the most extensive series of ultrabasic environments in New Guinea, the presumed type locality for *M. arachnoidea* is apparently outside the serpentine zone (see Dow & Davies 1964). While this is not entirely certain because of the geographic imprecision of the type, the new record at Taraka is clearly from a non-ultrabasic habitat.

At the Taraka locality, *M. arachnoidea* occurs as an umbrophile in remnant patches of lowland rainforest between 200–300 m elevation. On the current system of forest resource classification (Hammermaster & Saunders 1995a) the new site is mapped as a medium-crowned low elevation forest (structural code Hm). The entire subdistrict is experiencing severe impacts from anthropogenic development, and the latest vegetation overlays are already outdated (Hammermaster & Saunders 1995b). The regrowth mosaic around Lae currently extends to a front about 16 km outside the city.

The rediscovery of *M. arachnoidea* is extremely ironic, in view of the plant's prolonged

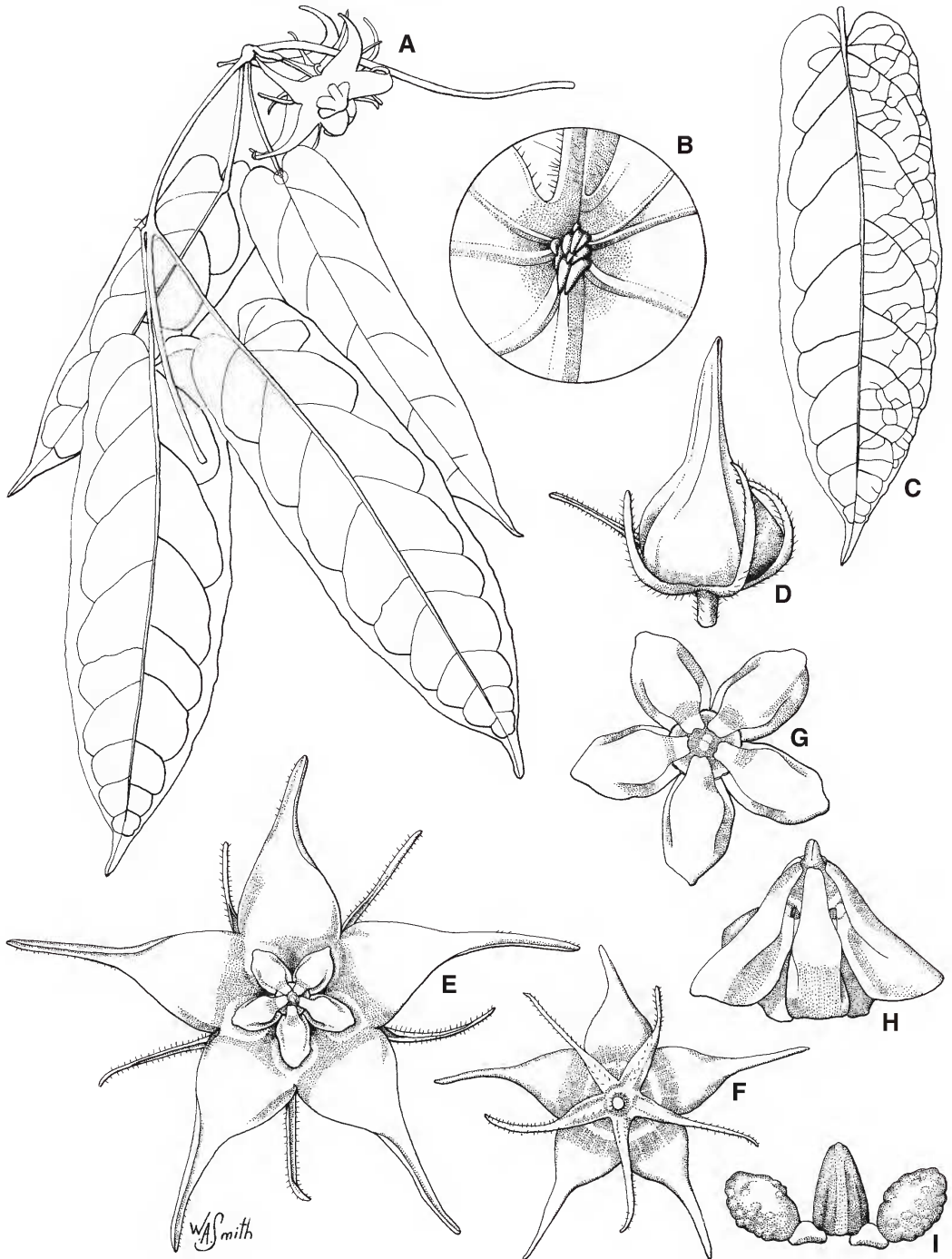


Fig. 1. *Marsdenia arachnoidea*. A. stem with flowering inflorescence $\times 0.5$. B. base of leaf lamina with colleters $\times 6$. C. adaxial leaf surface showing venation $\times 0.5$. D. bud $\times 1.5$. E. face view of flower $\times 1.5$. F. back view of flower showing sepals $\times 1$. G. face view of staminal column and corona $\times 3$. H. side view of staminal column and corona $\times 3$. I. face view of pollinarium $\times 20$. All from *Takeuchi 16667* (BRI). Del. W. Smith.

absence from the scientific record and the belated realization that it has been present all this time on the outskirts of PNG's second largest city. The new occurrence is just 5 km from the University of Technology, the principal training center for forestry science in the country, and is only 7–8 km from the National Herbarium. *Tapeinosperma magnifica* Pipoly & Takeuchi was recently described from the same habitat as the new populations of *M. arachnoidea* and the two species occur together in the Taraka understory.

Typification: For various reasons (logistics, land access, habitat alteration), it is unlikely that *M. arachnoidea* will be recollected at the location where it was found by Schlechter nearly 100 years ago. In view of the desirability of typifying such an unusual species, a neotype has been designated from the recent collections obtained near Lae.

Notes: Although the Taraka collections are referable to *Marsdenia arachnoidea*, there are some minor differences between these specimens and the one illustrated by Schlechter (1913). In the type collection, the sepals were noticeably longer than the corolla lobes, whereas in the new collections they are slightly shorter, and sometimes as small as one-half the length of the corolla. Irrespective of this variation, the filiform sepals are highly distinctive and quite unlike those in any other species of *Marsdenia*. The single leaf depicted in Schlechter's figure is also much longer and with more lateral veins (possibly up to 15, versus 9 or 10) than in the specimens at hand. These distinctions may warrant future recognition at the infraspecific level, but such determination will require examination of specimens from the original locality.

Marsdenia arachnoidea has morphological affinities to *M. hemiptera* H.Rchb. and *M. jensenii* P.I.Forst. from Australia, and to *M. brunnea* P.I.Forst., *M. grandis* P.I.Forst. and *M. lorea* S.Moore from New Guinea. The diagnostic differences between these species are discussed in Forster (1995, 1997).

Conservation status: Based on existing information, the conservation outlook for *M. arachnoidea* is precarious. Morobe

Province is probably the most comprehensively collected area in New Guinea (Conn 1994; Johns 1995) and this rather spectacular species having been collected only thrice in nearly 100 years indicates that it is genuinely rare, rather than merely overlooked. Shortly after the neotype was obtained, the collection site for *Takeuchi & Ama 16667* was destroyed by forest-clearing in a process recalling the discovery of *Madangia inflata* P.I.Forst., D.J.Liddle & I.M.Liddle from a similarly impacted area (Forster *et al.* 1997). Forest removal by subsistence agriculture and industrial logging is a serious and ongoing process in many parts of PNG.

A disproportionate number of asclepiads from New Guinea are under collected and consequently poorly known. This is exemplified by the startling fact that twenty-one of the fifty species of Papuan *Marsdenia* that are currently recognised (Forster 1996) are represented by single collections (Forster 1995). As is often the case with relatively inconspicuous taxa, it is likely that additional populations will be eventually discovered for the single-record plants (Forster 2000). Although the conservation status of *M. arachnoidea* is undoubtedly 'Data Deficient' (IUCN 2001), the recently documented occurrences can be provisionally considered as 'Critically Endangered' under the Criterion B2 as the area of occupancy is under 10 km² with one extant location (a) and there is a continuing decline in the area, extent and/or quality of habitat (b(iii)) and of the number of locations or subpopulations (b(iv)).

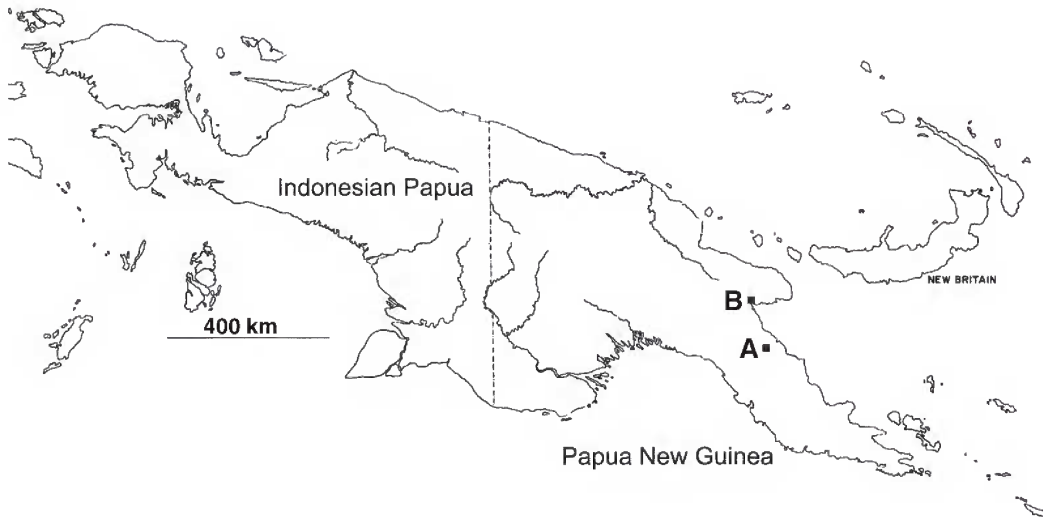
Etymology: The specific epithet is derived from the Latin *arachnoideus* (cobwebby), a probable allusion by Schlechter to the appearance of the flowers and their superficial similarity to species of *Brachystelma* R.Br. ex Sims from South Africa and Papua New Guinea with which he was familiar (Schlechter 1895, 1913; Nicholas 1992; Forster 1994). A number of *Brachystelma* species (e.g. *B. dinteri* Schltr., *B. elongatum* (Schltr.) N.E.Br., *B. glabriflorum* (F.Muell.) Schltr., *B. longifolium* (Schltr.) N.E.Br. and *B. meyerianum* Schltr.) have a dense indument of trichomes on adaxial corolline surfaces. This indument can impart a 'fuzzy' or 'cobwebby' appearance to the flowers.

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Map 1. Island of New Guinea. Localities for *M. arachnoidea*. A. The type locality (above Dschischungari) as inferred from Schlechter's itinerary, Morobe Province. B. Taraka, Lae subdistrict, Morobe Province.